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ABSTRACT

This paper focuses on identifying the way that individual and organizational variables affect the classroom leadership behavior of teachers. Measured are the effects of one individual-level variable and six organizational variables--three at the organization system level and three at the classroom subsystem level. The individual-level variable is teachers' attitudes toward control. The classroom subsystem variables are perceived student competence, student level, and class size. The organization system-level variables are formal participation, informal participation, and individuals' perceptions of the participativeness at their college. Data collected from 147 community college teachers and their students indicate that organizational and classroom characteristics may have an impact on teacher behavior, but that this impact sometimes is moderated by the attitudes of teachers toward control. (Author/MLF)

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A Systems Approach to Explaining Teachers' Leadership Behavior

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This paper focuses on identifying the way in which individual and organizational variables affect the classroom leadership behavior of teachers. Data collected from 147 community college teachers and their students indicate that organizational and classroom characteristics may have an impact on teacher behavior, but that this impact sometimes is moderated by the attitudes of teachers toward control.

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A Systems Approach to Explaining Teachers' Leadership Behavior

The assumption often is made that the way in which schools are organized has some effect on the way in which teachers run their classrooms. It seems reasonable to assume, for example, that teachers in schools that are relatively open and participative would run their classrooms more democratically than would teachers in relatively closed and autocratic organizations. There exists, however, only a limited amount of data to support this kind of assumption. Little research has focused on the effects of organizational system and subsystem characteristics on the classroom behavior of teachers, and even less has considered these effects for teachers with different attitudes, backgrounds, or qualifications.

The purpose of this paper is to explore the relationship between selected organizational variables and teachers' classroom behavior from the perspective of organizational systems theory. Systems theory, by focusing on the concept of role, highlights the combined effects of individual and organizational variables on behavior. According to Katz and Kahn, role expectations and role behaviors are the products of a complex interaction of individual attributes, interpersonal factors, and organizational characteristics.[2] This perspective suggests that the way in which the teaching role is carried out may be influenced by organizational variables, but that the effects of these variables may depend on the characteristics of the particular role encumbents.

By considering both individual and organizational variables, the systems approach subsumes two other perspectives on organizations which have implicitly guided research on role behavior. The first is the structural perspective--exemplified by sociological research which attempts to explain teacher behavior in terms of such contextual factors as the authority structure of the school, the subject being taught, and the patterns of interaction among students.[3]

The second perspective is personalistic and is exemplified by psychological studies which attempt to relate the behavior and performance of teachers to their values, attitudes, experience, and other personal characteristics.[4] Structuralistic research tends to de-emphasize the importance of individual factors and, consequently, the results of such research may be applicable only to teachers with the same characteristics as those being studied. Personalistic research tends to downplay the potential impact of contextual factors; thus its results may be applicable only to teachers working within organizational settings similar to those represented in a particular study. In effect, when research is conducted from either one of these two perspectives, factors considered by the other to be primary variables affecting behavior are assumed to be constants.[5]

Research based on the systems approach is not subject to such limitations and, possibly as a result of this, studies designed around systems theory have become increasingly prevalent.[6] The results of this research indicate that certain individual and environmental variables, which appear to have no direct relationship to behavior or performance, may have a more subtle and indirect effect on these variables when considered interactively.[7] The present paper builds on this prior research and explores the utility of the systems approach for explaining teacher behavior. Individual and organizational variables, as well as the interaction between these variables, are considered in a hypothetical model of the leadership behavior of teachers in the classroom. A statistical technique designed for "moderator research" is used to determine whether individual and organizational variables have any impact, beyond their direct effects, on teacher behavior.

Theoretical Background

Research conducted in various settings provides evidence that the

leadership behavior of members can be explained in terms of a number of measurable individual and organizational factors. This paper centers on the effects of one individual-level variable and six organizational variables—three at the organizational system level and three at the classroom subsystem level.

Teacher Leadership Behavior

The behavior and performance of teachers typically is measured in terms of a set of complex and relatively independent factors or dimensions.[8] There is some evidence, however, that certain unidimensional measures of leadership behavior may not only be acceptable from a conceptual standpoint but also may be related to important outcome and predictor variables. One such measure is a classroom analogue of the System 4 leadership behavior construct developed and operationalized by Likert.[9] System 4 leadership represents an actively participative behavior pattern rather than a consultative (System 3), benevolent authoritative (System 2), or exploitative authoritative (System 1) style of organization management and leadership. It is characterized by active direction of subordinates' activities as well as receptivity to their influence.

Likert presents System 4 management as a homogeneous pattern involving supervisory behavior and other aspects of organizational structure and process.[10] In some situations, the supervisory style consistent with this pattern breaks down into relatively independent dimensions of leadership behavior; in other situations, however, it emerges empirically as a behavioral "type."[11] A substantial amount of research has shown that this type of supervisory style—that is, leadership which is viewed as supportive and participative—is associated with workgroups that are high in "total control," satisfaction, and productivity.[12] Though less research is available regarding

the factors that explain or predict System 4 leadership, Likert implies that both individual and organizational factors can promote this type of behavior.[13]

The Classroom Subsystem

Structuralist and sociological researchers have identified various environmental factors that are likely to have an impact on teacher behavior.[14] At the level of the organizational subsystem within which teachers work (i.e., the classroom), these factors include the perceived competence of the students, their grade level, and the size of the class.

There is a significant amount of evidence that the behavior of teachers is affected by the perceived competence of students[15] and, more generally, that the leadership behavior of superordinates is affected by their perceptions of the competence of their subordinates.[16] Ashour and England, for example, have shown that the perceived competence of subordinates is a major factor associated with leaders' assignment to them of discretionary tasks.[17] The grade level of students may affect the leadership behavior of teachers in a similar manner. This is suggested by the results of a simulation study by Rosen and Jerdee. Their subjects were found to endorse a participative approach for subordinates at higher job levels more strongly than for those at lower levels.[18] The number of students in a class--regardless of their competence and grade level--also may have a bearing on the leadership behavior of teachers. Participation of members possibly becomes more difficult as the size of a group increases, and teachers may be less prone to behave in a participative manner when dealing with large groups of students.[19] Thus, System 4 leadership behavior on the part of teachers is expected to be promoted by students who are perceived as competent, upper-level students and by small classes.

The Organizational System

Variables at the level of the organizational system also may have an impact on the leadership behavior of teachers in the classroom.[20] In particular, the participativeness of the organizational setting may affect the extent to which teachers are participative and supportive in their interactions with students. At the organizational level, participation implies a system of control in which all members determine in some degree the decisions of the organization. This participation may occur formally and may also occur informally. Formal participation refers to a system in which rules explicitly establish decision-making procedures or structures through which members contribute to decisions. Informal participation refers to a system in which members are personally responsive to the ideas and suggestions of each other and are therefore mutually influential. An educational organization may be characterized by formal and/or informal systems of participation, and both types of systems may have an impact on the leadership behavior of teachers in their classrooms. Teachers in participative organizations are likely to have more influence than those in non-participative organizations and may be in a better position to share their influence with students. Furthermore, the prevailing norms of a participative organization are likely to support System 4 behavior and teachers may adopt, within their classrooms, leadership styles that are consistent with these expectations.[21] This suggests that the effects of participation (whether formal or informal) may be particularly strong when this participation is perceived by individual teachers. Thus, perceived participation--that is, the individual's perceptions of the participativeness of his or her school or college--potentially is an important subjective predictor of classroom leadership behavior.

Individual Characteristics

Personalistic and psychological studies have identified a variety of individual-level variables which may be related to teacher behavior and performance.[22] The variable to be considered here concerns teachers' attitudes toward control. If it is assumed that attitudes are indeed reflected in behavior, a teacher's attitudes concerning appropriate sources of organizational control and influence should correspond to his or her actual participativeness in the classroom.[23] Teachers who prefer a democratic sharing of control between students and faculty would be expected to behave in a System 4 or possibly a System 3 manner, and those who prefer a more hierarchical distribution of control would be expected to behave in a System 2 or 1 manner.

This hypothesized relationship between the attitudes and behavior of leaders, however, is based on only a minimal amount of empirical evidence. Both Korman's review of the consideration and initiating structure literature and Kerr and Schriesheim's "update" of it have reported little relationship between supervisors' attitudes toward leadership patterns and their actual behavior.[24] In an extensive review of the literature on attitude-behavior relationships of all kinds, Wicker has documented the general inability of researchers to establish through experiments strong connections between attitudes and behavior.[25] Fishbein and Ajzen have developed further some of Wicker's explanations for this problem and, by comparing successful and unsuccessful studies on attitudes and behavior, have suggested some ways in which this research could be improved both methodologically and conceptually.[26] One possible improvement that is highly consistent with the systems approach is based on the suggestion that attitudes serve largely to influence or moderate the effects of situations on behavior. Thus, regardless of whether or not teachers' attitudes toward control are directly related to their

leadership behavior, these attitudes may affect the extent to which this behavior is influenced by classroom and organizational characteristics.

Classroom subsystem and teachers' attitudes. Teachers' attitudes toward control potentially can moderate the impact of classroom variables on their leadership behavior in at least three different ways. First, the impact of classroom characteristics may be particularly great for teachers with participative attitudes and relatively weak for those with autocratic attitudes. Small classes and competent students may serve to "activate" System 4 behavior on the part of those teachers who prefer high levels of student control.[27] A similar classroom situation, however, may have little or no effect on the leadership behavior of teachers who are not predisposed toward student participation.

Second, the effects of classroom variables may be moderated by teachers' attitudes in the opposite way. The classroom subsystem may have a particularly strong impact on the leadership behavior of teachers who prefer relatively low student influence. Teachers with participative attitudes may uniformly exhibit System 4 leadership styles,[28] but those with autocratic attitudes may be willing to try this style of classroom management only with high-level students, with particularly competent students, and/or in small classes.

A third possibility is that neither the teachers with highly participative attitudes nor those with highly autocratic attitudes are affected very much by the classroom environment. Their classroom leadership styles may be determined mainly by their attitudes rather than by external factors. However, those teachers with intermediate attitudes--that is, those whose attitudes are neither strongly participative nor strongly autocratic--may be greatly affected by the characteristics of the particular class being taught. They may exhibit System 1 or 2 leadership styles in large classes or with less

competent students and System 3 or 4 styles in small classes or with more competent students. Since all three of these possibilities are based on viable assumptions, a statistical technique sensitive to these different moderating effects will be used to explore the impact of teachers' attitudes toward control.

Organizational system and teachers' attitudes. Like the effects of classroom variables, the effects of organizational participativeness on teachers' behavior may be moderated by attitudes in various ways. First, teachers preferring relatively high student influence may be more strongly affected by the participativeness of their organizations than are autocratic teachers. A formally or informally participative organization can support the attitudes of teachers with participative ideals and, by legitimating the principle of student influence in the classroom, encourage System 4 behavior. A non-participative organizational structure, however, might interfere with the expression of System 4 behavior in the classroom, even when it does not eliminate the verbal expression of participative attitudes. In contrast, autocratic teachers may not be affected very much by the control structure of their schools. The participativeness of the larger organization may do little to promote or impede System 4 leadership by these teachers in their classrooms. This possible moderating effect is consistent with the assumption that persons with participative ideals are more likely than those with autocratic ideals to be open to the influence of the superordinate system.[29]

A second possibility is that teachers with autocratic attitudes follow the control pattern of the institutions of which they are members. If this were the case, the participativeness of the organization would have a great effect on such teachers. Furthermore, teachers with participative attitudes may behave in a System 4 manner regardless of the prevailing pattern of

control in the institution. This alternative is based on the assumption that persons with autocratic ideals accept and behaviorally reflect the structure of the superordinate system. Both this and the previous alternative, however, may be incorrect. As noted above, the leadership behavior of teachers with extreme attitudes may not be greatly affected by their organizational setting. Those teachers with intermediate attitudes toward student control may be the ones whose behavior is most strongly influenced by the participativeness of the larger system.

Hypotheses

The hypotheses suggested by this review of the literature are summarized below and illustrated in Figure 1.

Hypothesis 1: Teachers with (a) students who are perceived to be competent, (b) high-level students, and/or (c) small classes are more likely than other teachers to exhibit System 4 leadership behavior in their classrooms.

Hypothesis 2: Teachers in organizations that are (a) formally participative, (b) informally participative, and/or (c) perceived to be participative are more likely than other teachers to exhibit System 4 leadership behavior in their classrooms.

Hypothesis 3: Teachers who prefer high student control relative to faculty control are more likely than other teachers to exhibit System 4 leadership behavior in their classrooms.

Hypothesis 4: The relationship between classroom subsystem characteristics (i.e., perceived student competence, student level, and class size) and teachers' leadership behavior is moderated by teachers' attitudes toward control.

Hypothesis 5: The relationship between organizational system characteristics (i.e., formal, informal, and perceived participativeness) and teachers' leadership behavior is moderated by teachers' attitudes toward control.

Insert Figure 1 about here

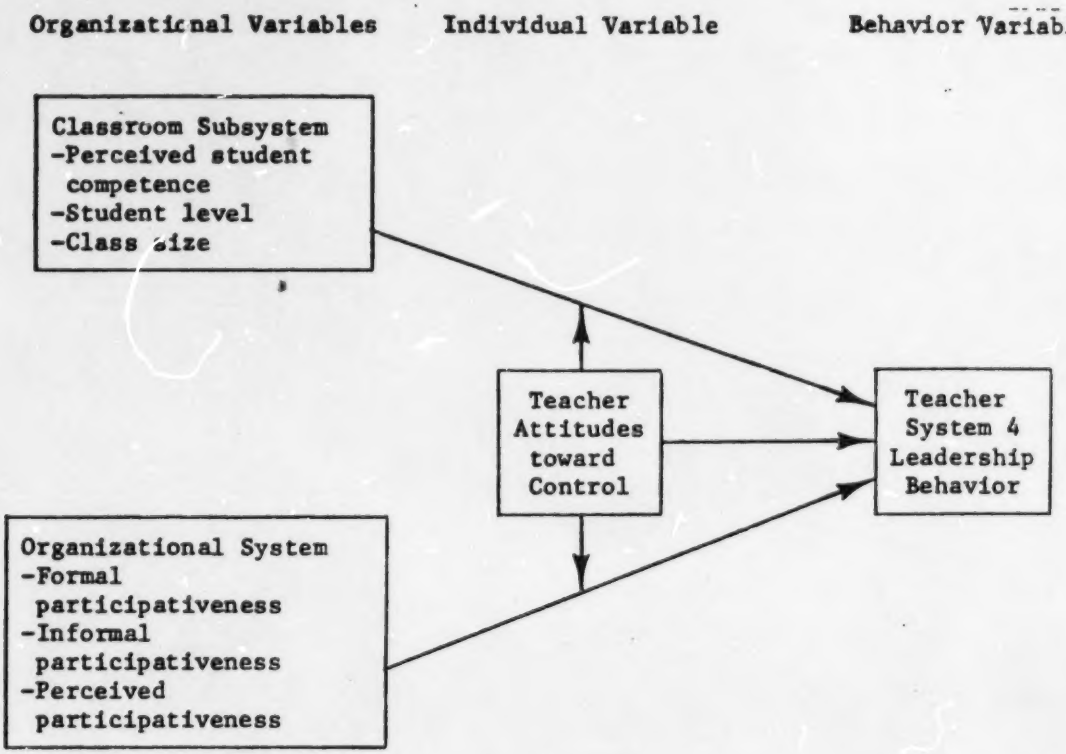

Figure 1. Individual and organizational predictors of teacher leadership behavior.

Methods

This research was carried out as part of a larger project which was supported by a grant from the National Institute of Education.[30] The project focused on the effects of control and participation in community colleges. The findings of this project with respect to the classroom subsystem are presented in this paper.

Sample

Data were gathered for the larger study from over 3,000 persons affiliated with 10 community colleges in the North Central and Middle States Associations of Colleges and Secondary Schools. These colleges were selected from a larger group of schools which had enrollments of between 1,500 and 3,200 students, were between 5 and 15 years old, and offered both transfer and technical programs. Through a procedure described below (see Formal Participativeness), this sample was selected to include five formally participative and five formally non-participative colleges.

The sample for this paper consists of 150 faculty members along with all students enrolled in one of the classes taught by each of these instructors. These classes were selected through the use of a sampling design that considered the total number of credit hours for which students were enrolled in each academic division within each college. Following this design, the probability of selecting a class in a division with, for example, 1,000 student-credit hours was twice the probability of selecting a class in a division with 500 student-credit hours. Fifteen classes were randomly selected through this weighting procedure from each of the 10 colleges. These classes were selected only from those which had between 15 and 25 students officially enrolled at the beginning of the semester. The sample for analysis consists of 147 classrooms since three teachers preferred not to complete a

questionnaire. The response rate for students was 89 percent--2,430 of the 2,727 students in the sample returned usable surveys.

Instruments and Measures

Most of the data collected for this study were gathered through the use of a questionnaire designed specifically for this research. Separate but "parallel" forms of this questionnaire were constructed for faculty members and students.[31] Some of the items included in these forms, particularly those relating to the leadership behavior of teachers, were adapted from the Survey of Organizations and other instruments developed at the Institute for Social Research at The University of Michigan.[32]

Teacher System 4 leadership behavior. Students in each class were asked five questions about the leadership behavior of their teachers:

1. To what extent does the instructor of this class provide you with information that lets you know how you are doing?
2. To what extent does your instructor make you feel free to take your complaints to him?
3. When you talk to your instructor, to what extent does he pay attention to what you have to say?
4. To what extent does the instructor of this class encourage people to give their best effort?
5. To what extent does the instructor of this class maintain high standards of performance?

The response options for these questions ranged from (1) "to a very little extent" to (5) "to a very great extent." Three of these questions are from the Survey of Organizations--item 3 on teacher support and items 4 and 5 on goal emphasis. The other two questions, item 1 on work facilitation and item 2 on support, are similar to those included in other surveys designed to measure System 4 leadership behavior.[33] Scale values were derived by first calculating the mean of each class's responses to each of these questions and

then averaging across the items. Values along this scale ranged from 2.34 (representing System 2 leadership) to 4.46 (representing System 4 leadership). The reliability of this leadership scale is .90 (coefficient alpha[34]).

Perceived student competence. This predictor of teacher behavior was measured through three items asking each teacher about his or her class:

1. To what extent do you find these students to be creative, interesting, and stimulating?
2. To what extent do these students pay attention to what you have to say?
3. To what extent do the students in this class maintain high standards of performance?

Two of these items (2 and 3) are worded very similarly to items included in the teacher behavior scale. Both students and teachers are asked about the extent to which the other "maintain(s) high standards of performance" and "pay(s) attention" to what they have to say. The meaning of the latter question probably differs according to the group being described. When students are asked to respond to this question in reference to their teacher, they are likely to answer primarily in terms of the extent to which they feel their teacher is open to influence. When teachers are asked to respond to this question in reference to their students, they are likely to answer largely in terms of their students' efforts to absorb information presented in the classroom.

The mean score for this scale is 3.46 and the range is from 1.33 (not competent) to 5.00 (extremely competent). The reliability of the scale is adequate ($\alpha = .80$), and no item is related especially strongly or weakly to the scale as a whole. Faculty members' responses to these items correlate significantly with the aggregated responses of the students to the question "To what extent do the students in this class maintain high standards of performance?" ($r = .41$, $N = 145$, $p < .01$).

Student level. Students were asked in their questionnaires to indicate whether they currently were: (1) first-year freshpersons, (2) second-year sophomores, or (3) non-classified. Based on their responses to this question, the percentage of second-year students in each classroom was calculated. These computations excluded students who reported that they were not classified as well as students who did not answer this question. The percentage of second-year students in the classes in this sample averaged 51.7 and ranged from 0 to 100.

Class size. Class size was estimated on the basis of the number of students in each class who completed questionnaires for this study. This estimate was used rather than one based on the number of officially enrolled students for two reasons. First, there was some question as to whether certain students who were enrolled in these classes were actually taking the courses. Many students had stopped attending the classes and had apparently dropped the courses even though official "drop slips" had not yet been processed. Second, the great majority of students attending these classes the day the survey was administered agreed to complete the form; relatively few of the students chose not to participate in the study. Thus, the number of student respondents, in contrast to the number of students officially enrolled, may provide a better estimate of the size of the classes on a typical day by compensating for late drops and normal absenteeism.

Formal participativeness. In selecting the sample of organizations for this study, a group of experts was asked to estimate the formal participativeness of 59 community colleges which fell within the age, size, and geographical boundaries outline above. These experts--consultants, researchers, community college faculty members and administrators, officers of professional associations, and state education officials--were asked to rate along a five-

point scale the formal participativeness of each college with which they were familiar. The end points of this scale were:

> 1.0 There are no or only a very few formal procedures (as few as you have ever seen in any college) that permit more than one of the above groups [faculty, students, etc.] to contribute to any important decisions.
>
> 5.0 There are extensive formal procedures (as extensive as you have ever seen in any college) that permit all of the above groups to contribute to most of the important decisions of the college.

The experts were provided with a page of text describing the factors to take into consideration in rating the colleges.[35] A sample of five formally participative and five formally non-participative colleges, matched in terms of size and other important variables, was selected on the basis of these ratings. The ratings for the formally non-participative colleges ranged from 2.25 to 2.88, and those for the participative colleges ranged from 3.55 to 4.22. These ratings, which will be used in this paper to represent formal participativeness, correlate .76 with the number of participative decision-making bodies in each college. (Participative bodies--e.g., senates, councils, advisory groups, and standing committees--were identified by reviewing faculty manuals, course catelogues, student handbooks, constitutions, and similar documents.)

Informal participativeness. Likert's work on interaction-influence systems and cooperative working relationships guided the measurement of informal participativeness for this study. His perspective emphasizes confidence and trust, open communication, and mutual influence among members of work groups and similar organizational subsystems.[36] In colleges, work groups are probably most closely approximated by departments and our measures therefore focused on these subsystems. Teachers in each department were asked the following four questions:

1. To what extent are the [faculty members with whom you come into contact] friendly and easily approached if you have a problem?

2. To what extent do you feel the [faculty members with whom you come into contact] have confidence and trust in you?

3. To what extent do you have confidence and trust in the [faculty members with whom you come into contact]?

4. To what extent do the [faculty members with whom you come into contact] take into account your opinions and suggestions?

These questions were asked of the 147 teachers in the present sample as well as of all the other full-time faculty members in their departments. Their responses to each of these four questions were aggregated to the departmental level, based on the assumption that the teachers responded to these items more in terms of the people in their own departments than in terms of people elsewhere in the college. The aggregated responses to these questions were then averaged, and each teacher was assigned the mean score derived for his or her department. These means scores ranged from 2.63 (participative to some extent) to 4.63 (participative to a very great extent) and averaged 3.88. The reliability of this index is .87.

Perceived participativeness. Faculty members were asked three questions concerning the decision-making practices of their college:

1. When decisions are made in this college, to what extent are the persons affected asked their views?

2. In this college, to what extent are decisions made by those who have the most accurate information?

3. To what extent do you feel you can appeal a decision that adversely affects you as an individual?

Each teacher's responses to these questions were combined to create an individual-specific and subjective measure of organizational participativeness. Scores along this measure ranged from 1.00 (participative to a very little extent) to 5.00 (participative to a great extent) and averaged 3.09. The

reliability coefficient is acceptable ($\alpha = .76$), but the third question is somewhat less strongly associated with the overall scale than are the other two. Evidence for the validity of this scale is provided by its positive correlation across colleges with a measure of the "slope," or distribution of control ($r = .68$, $N = 10$, $p < .05$).[37]

Teacher attitudes toward control. The preferences of teachers regarding the relative balance of student and faculty control were estimated through the use of questions regarding the "ideal" influence of these two groups. A total of six questions was asked about the influence of these groups with respect to three decisional domains:

1. How much influence should [faculty/students] actually have in determining the major goals of this college?
2. How much influence should [faculty/students] actually have on the day-to-day administration of this college?
3. How much influence should [faculty/students] actually have on course activities?

Two separate influence scales were constructed on the basis of responses to these questions--ideal student influence ($\alpha = .74$) and ideal faculty influence ($\alpha = .61$). The items least strongly related to the scales are those regarding classroom influence. The especially low relation of ideal faculty influence in the classroom to the scale total, and thus the low reliability of the scale, is due partly to the lack of variance in that item; almost all of the teachers felt they should have "quite a lot of influence" or "very great influence" in classroom matters.

A regression technique was used to combine the two influence scales into a single measure of attitudes toward control.[38] Ideal student control was regressed on ideal faculty control to derive, for each respondent, a residual score representing the amount of student influence not explained by faculty

influence. Conceptually, this score represents the difference between the real value of ideal student influence and the value one would predict from a teacher's ideal faculty influence score. Thus, a low value represents "autocratic" attitudes and a high value represents "participative" attitudes. The reliability (.58) of this derived scale, however, is not very high.[39] While possibly adequate for assessing the somewhat exploratory hypotheses proposed here, the reliability of this measure should be improved for subsequent studies.

Analytical Methods

Two major analytic procedures were used to test the hypotheses outlined above. First, product-moment correlations were calculated between teacher leadership behavior and the three classroom subsystem variables (Hypothesis 1), the three organizational system variables (Hypothesis 2), and teachers' attitudes toward control (Hypothesis 3). These correlations were tested for significance using Fisher's Z_r transformation.[40] Second, teachers were divided into three groups of approximately equal size on the basis of their scores on the measure of attitudes toward control. Approximately equal groups were produced by dividing the sample at points half a standard deviation above and below the mean of the teacher attitudes variable. Differences across the three groups in the association of teacher leadership behavior with the classroom subsystem variables (Hypothesis 4) and with the organizational system variables (Hypothesis 5) were assessed by comparing both correlations and unstandardized regression coefficients. (Correlation coefficients, while more directly interpretable in terms of the proportion of variance explained than are regression coefficients, can be greatly affected by variance differences at different levels of a moderator. Unstandardized regression coefficients are not as strongly affected by variance differences and for

this reason have been recommended as the preferable statistic of association for use in moderator research.[41]) The differences predicted among each set of three correlations were tested for significance using Hays' V statistic, a generalization of the Fischer Z_r transformation.[42] A description of the test for differences among unstandardized regression coefficients is provided by Brownlee.[43] When partial correlations or partial unstandardized "regression" coefficients are compared, significance tests used are adjusted for the reduction in degrees of freedom.

Both zero-order and partial correlations and regression coefficients were calculated for each predictor at the three levels of the hypothesized moderator variables. All except one of the partial coefficients were based on residual scores derived by regressing both the predictors of teacher behavior and teacher behavior itself on the variable having the highest direct association with teacher behavior--perceived student competence. The partial associations between perceived student competence and teacher behavior, the one exception to this rule, involve a similar procedure except that residuals of regression based on the variable having the second highest association with teacher behavior are used--perceived participativeness. Residuals were computed for all variables prior to dividing the sample into subgroups based on teacher attitudes toward control.

The procedure used to assess the moderating effects of teacher attitudes involves splitting a continuous variable. This procedure commonly is used along with various correlational techniques under the labels "heterogeneous regression," "quadrant analysis," or simply "moderator research."[44] One of the strongest criticisms of continuous variable categorization (and of this approach to assessing moderation) is that substantial variance is lost when continouous variables are split. Kerlinger and Pedhazur have made this criticism using

an example in which dichotomous splitting of a continuous variable changed a strong relationship into a weak one.[45] More recently, however, Wylie has demonstrated that trichotomous splits (or groupings using even more categories) result in much smaller variance losses than do dichotomous splits.[46] While some variance is lost through trichotomization, this loss generally is not large enough to reduce the utility of this approach to assessing moderation. A further criticism of this approach is that a high correlation between the moderator and the predictor can result in a merely apparent moderating effect. This problem becomes more critical as the relation between the predictor and the criterion increases.[47] The scale intercorrelations in the present analysis, presented below in Table 1, generally are not high enough to interfere with the interpretation of results; however, the relationship of .26 between student competence and the moderator variable should be noted.

Results

Main Effects

Correlations pertaining to Hypotheses 1, 2, and 3 are presented in Table 1. With respect to Hypothesis 1, the only classroom subsystem variable significantly related to teacher leadership behavior is perceived student competence ($r = .37$). Neither student level nor class size is strongly associated with teacher behavior as measured in this study. With respect to Hypothesis 2, neither formal participativeness nor perceived participativeness is significantly related to System 4 behavior in the classroom. The correlation between departmental informal participativeness and teacher behavior ($r = .17$) is significant at the .05 level given an N of 149 classrooms. (A slightly different and possibly less significant correlation might have been obtained had these data been aggregated within departments rather than classrooms.) Finally, Hypothesis 3 is not supported; teachers' attitudes toward

control are not strongly related to their classroom leadership behavior as perceived by students. Thus the data provide little support for the expected direct effects of the organization system, classroom subsystem, and individual variables on teacher leadership behavior. The only variable measured which shows a strong relationship to leadership behavior is perceived student competence.

Insert Table 1 about here

Moderated Effects

The teachers were divided into three groups on the basis of their preferences concerning the level of student control relative to faculty control. The "participative group" includes teachers who prefer a higher level of student control than would be predicted given their preferred level of faculty control. The "autocratic group" includes those who prefer less student control than the amount that would be predicted given their preferences for faculty control. The "intermediate group" includes the remaining teachers--those whose preferences regarding student control are close to what would be predicted from their preferences for faculty influence. The correlation between a scale reflecting this trichotomous grouping and the continuous scale measuring teacher attitudes toward control is .90. This indicates that about 19 percent of the variance in the continuous scale was lost through the splitting procedure.

Insert Table 2 about here

Correlations and unstandardized regression coefficients reflecting the association between the predictor variables and System 4 behavior are presented in Table 2 for teachers with autocratic, intermediate, and participative attitudes. The pattern of differences among the correlations and regression

Table 1

Correlations between Measures

	Teacher Leadership Behavior	Perceived Student Competence	Student Level	Class Size	Formal Participativeness	Informal Participativeness	Perceived Participativeness
Teacher Leadership Behavior							
Perceived Student Competence	.37**						
Student Level	.03	-.12					
Class Size	.13	.04	-.08				
Formal Participativeness	.16	-.02	-.19*	.13			
Informal Participativeness	.17*	.20*	.06	.09	.13		
Perceived Participativeness	.04	-.08	.12	.18*	.20*	.05	
Attitudes toward Control	.12	.26**	.07	.08	-.16	.04	.02
		Classroom Subsystem Variables			Organizational System Variables		

*p < .05

**p < .01

N=147

Table 2

Correlations between Organizational Variables and Classroom Leadership Behavior for Teachers with Different Attitudes toward Control

Organizational System or Subsystem Variable	Teacher Attitudes toward Control	N[a]	r (zero-order)	b (zero-order)	r' (first-order[b])	b' (first-order[b])
Perceived student competence	Participative	44	.46**	.32**	.50**	.35**
	Intermediate	52	.35**	.20**	.34**	.19**
	Autocratic	49	.27*	.14*	.26*	.14*
Student level	Participative	45	-.05	-.08	.06	.08
	Intermediate	54	.01	-.01	-.00	-.00
	Autocratic	49	.17	.19	.16	.17
Class size	Participative	45	.13	.01	.16	.01
	Intermediate	54	.20	.01	.18	.01
	Autocratic	49	.01	.00	.01	.00
Formal participativeness	Participative	45	.41**	*.28***	.42**	*.26***
	Intermediate	54	.15	*.09*	.23	*.12*
	Autocratic	49	-.05	*-.02*	-.07	*-.04*
Informal participativeness	Participative	45	.28*	.56*	.18	.34
	Intermediate	54	.25*	.24*	.17	.15
	Autocratic	49	-.06	-.08	-.08	-.11
Perceived participativeness	Participative	45	.25	.13	*.39***	*.19***
	Intermediate	52	-.07	-.03	*-.09*	*-.04*
	Autocratic	49	-.07	-.03	*-.04*	*-.02*

*$p < .05$; **$p < .01$; significant differences ($p < .05$) among the correlations or unstandardized regression coefficients for the three groups of teachers are indicated by italics.

[a]Sample sizes given are for the zero-order correlations and regression coefficients. The N's for the first-order partial coefficients are as follows: participative—44; intermediate—52; and autocratic—49.

[b]The partial coefficients involving the relationships between perceived student competence and teacher behavior are based on residuals of the regression of these variables on perceived participation. All of the other partial coefficients are based on residuals of regression of perceived student competence.

coefficients for these groups is fairly similar for the zero-order and partial relationships. This pattern provides some support for Hypotheses 4 and 5. In general, the moderated relationships suggest that the behavior of teachers with participative attitudes is more strongly influenced by classroom and organizational characteristics than is the behavior of teachers with autocratic attitudes. In particular, while two of the environmental variables--perceived student competence and informal participativeness--have significant overall associations with teacher behavior, two other variables--perceived participativeness and formal participativeness--have a strikingly larger association with the behavior of participative teachers than autocratic teachers.

First, the zero-order moderated results indicate that perceived participativeness has a low positive relationship with the leadership behavior of teachers with participative attitudes but a negligible negative relationship with the behavior of teachers in the intermediate and autocratic groups. The differences among these zero-order correlation and regression coefficients do not quite reach the accepted level of statistical significance. The partial correlations and unstandardized regression coefficients, however, which control for perceived student competence, are significantly different across the three groups of teachers. The pattern of partial correlations and partial regression coefficients clearly indicates that the perceived participativeness of the college is more positively related to the behavior of teachers with participative attitudes than it is to the behavior of other teachers.

Second, expert ratings of the formal participativeness of the college are strongly related to System 4 behavior for teachers with participative attitudes but not for teachers with autocratic or intermediate attitudes. Both the zero-order and partial regression coefficients differ significantly across the three groups of teachers. (The differences among correlations, however, fall

slightly short of the adopted .05 significance level.) Like the percieved participativeness of the college, formal participativeness is related to the System 4 behavior of only those teachers who have participative attitudes toward control.

Discussion

The results of this study provide some evidence that the systems approach can be more useful for understanding the classroom leadership behavior of teachers than a narrow personalistic or structuralistic approach. Considering both organizational system and classroom subsystem variables led to the identification of direct, unmoderated relationships between formal participativeness and perceived student competence, on the one hand, and teacher leadership behavior, on the other. By directing attention to the possible interactive effects of individual and organizational variables, the sytems approach also helped to reveal certain implications of these variables for teacher behavior which otherwise might not have been discerned. Teachers' attitudes toward control, which appeared to have no direct impact on their leadership behavior, were found to moderate the effects of other variables on this behavior. Experts' ratings of formal participativeness and the perceived participativeness of the college, which appeared to be unrelated to teacher leadership behavior in the sample as a whole, were found to be related to the classroom behavior of the subgroup of teachers with participative attitudes, but not with other teachers' behavior. Taken together with data for other predictors of behavior which show similar trends, these data indicate that the behavior of teachers who have participative attitudes may be generally more strongly affected by organizational variables than is the behavior of other teachers in the present sample.

Though some of these findings are not particularly strong, future studies

based on the systems approach are likely to produce more conclusive results. Stronger findings might be obtained by using different measures than those used here and by considering additional variables and relationships. The present measure of teachers' attitudes toward control, in particular, may have limited the extent to which the true moderating effect of this variable was observed. This variable, as measured here, combines control over both classroom-level and college-level decisions; a more restricted variable, focusing only on decisions pertaining to the classroom, might be measured more reliably and might also have a greater moderating effect. And though a measure of teacher leadership behavior with several subscales would complicate the model, such a measure might produce stronger and more conclusive findings. For example, the effects of organizational system and classroom subsystem variables on certain dimensions of leadership behavior—especially those involving participativeness--may be moderated by teachers' attitudes toward control, but their effects on other dimensions may not. The complexity and potential explanatory power of the model could be increased further by considering additional variables and relationships. A more complete model might incorporate such variables as subject matter and instructional technology. Also, additional causal paths between the variables already included in the model could be considered. For example, student competence--which was hypothesized to affect teacher behavior--is likely to be reciprocally affected by the behavior of teachers, and this additional causal path could be added to the model.

Models based on the systems approach can be made, at least in principle, as complex as necessary to include the many variables and relationships that may seem pertinent to a particular research issue. Highly complex models, however, are not necessarily optimal from the perspective of either research

or practice. Models which include scores of variables and relationships may be difficult for the writer to explicate, and may be even more difficult for the reader to interpret and to use as a basis for future research and practice. Nevertheless, the results of the present study indicate that undue simplicity in causal models also should be avoided. Models that focus on either individual or organizational variables to the exclusion of the others may fail to reveal the way in which these variables affect the behavior of individuals in educational systems.[48]

While it is difficult to generalize findings based on classes in only ten community colleges to all educational organizations, three tentative implications for educational administration can be drawn from this study. First, the data provide a bit of empirical support for the assumption that the way in which administrators run their schools is related to the way in which teachers run their classrooms. More specifically, the classroom leadership behavior of those teachers who prefer relatively high student influence is likely to be most participative and supportive when the larger organization is perceived to be participative. Thus, administrators may find that what goes on within classrooms is affected not only by the outcome of schoolwide decisions but also by the extent to which teachers are included in making them.

Second, the results indicate that the leadership behavior of many teachers is affected by the extent to which they perceive their students to be competent. Thus, if courses are arranged so that highly competent students are enrolled in certain classes and less competent students are enrolled in others, the former classes may be run quite differently than the latter. Results based on the sample of teachers and community colleges used in the present study indicate that perceived student competence is much more important to teacher behavior than are other variables that have typically been considered important

such as class level and class size. Teachers' responses to differences in perceived student competence may be functional if these perceptions are accurate, and if more competent students respond positively to System 4 leadership and less competent students do not. However, these differences may be dysfunctional if teachers' perceptions of students' competence are inaccurate, if students' reactions to System 4 leadership have little to do with their competence, or if other factors render a certain leadership style inappropriate. In any case, administrators should consider the possibility that the way in which students self-select themselves into (or are assigned to) different courses may affect the extent to which certain teachers exhibit System 4 leadership behavior. This possibility also should be considered when evaluating teachers in terms of their participativeness, attentiveness to students, or supportiveness. The behavior of certain teachers--particularly those who prefer relatively high student influence--may be more a response to the perceived competence of a particular group of students than a direct reflection of the teachers' preferences regarding classroom management styles or their true ability to use these styles.

Finally, the results of the study indicate that there are important differences among teachers in terms of their attitudes toward control and that these differences should be considered by administrators. While these attitudes may not be directly reflected in the leadership behavior of teachers, they may be reflected in the extent to which their behavior is influenced by characteristics of the organization and other people in the system. Thus, on the one hand, administrators may find that teachers who prefer relatively high student influence are open to their environment and actively adapt their behavior to situational factors. With respect to these teachers, the critical task for educational administrators may be to create an environment that will

promote functional rather than dysfunctional behavioral adjustments. On the other hand, administrators may find that teachers who prefer relatively low student influence are relatively closed and are not very responsive to environmental factors. With respect to these teachers, the task for administrators may be to identify ways to make these faculty members more responsive to the larger organizational system and to their students.

Reference Notes

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10. Ibid., pp. 48-49, 126-127. The System 4 management style, as presented by Likert, should be distinguished from the System 4 belief system, presented by O. J. Harvey and others. While Likert's System 4 refers to participative leadership, Harvey's System 4 refers to an abstract (rather than concrete) belief system. It is interesting to note, however, that System 4 beliefs are likely to be associated with System 4 leadership behavior. Harvey has found, for example, that the overt classroom behavior of teachers with abstract belief systems is significantly less dictatorial than that of teachers with concrete belief systems. O. J. Harvey, M. Prather, B. J. White, and J. K. Hoffmeister, "Teachers' Beliefs, Classroom Atmosphere, and Student Behavior," American Educational Research Journal 5 (1968): 151-166. And O. J. Harvey, D. E. Hunt, and H. M. Schroder, Conceptual Systems and Personality Organization (New York: Wiley, 1961).

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$$r_{x_{2\cdot1}x_{2\cdot1}} = \frac{r_{x_2x_2} - 2r^2_{x_1x_2} + r^2_{x_1x_2} r_{x_1x_1}}{1 - r^2_{x_1x_2}}$$

The reliabilities of the two attitude scores on which the residual gain score and its reliability are based are estimated using Cronbach's alpha coefficient, a conservative internal consistency estimate (Cronbach, op. cit.). Other authors have demonstrated that the reliability of difference scores for which the measurement errors of their components are correlated are higher than is indicated by such formulas. H. Webster and C. Bereiter, "The Reliability of Changes Measured by Mental Test Scores," in Problems in Measuring Change, ed. C. W. Harris (Madison, Wis.: University of Wisconsin Press, 1963). R. H. Williams and D. W. Zimmerman, "The Reliability of Difference Scores When Errors Are Correlated," Educational

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